

What is claimed is:

1. A stylus for use with a user input device, comprising:
a housing comprising an entrance aperture configured to collect ambient light and an exit aperture configured to emit the collected light, wherein the exit aperture is proximate a tip
5 of the stylus; and

a light guide disposed within the housing, wherein the light guide is in optical communication with the entrance aperture and the exit aperture such that the light guide directs collected light from the entrance aperture to the exit aperture;

wherein the stylus produces a defined intensity profile detectable by the user input
10 device when at least a portion of the tip of the stylus is proximate an input surface of the user input device.

2. The stylus of claim 1, wherein the entrance aperture is proximate an end of the housing opposite the tip.

15 3. The stylus of claim 1, wherein the entrance aperture is proximate the tip.

4. The stylus of claim 3, wherein the entrance aperture is configured to collect ambient light including light emitted by the user input device.

20 5. The stylus of claim 1, wherein the entrance aperture comprises a collector to collect ambient light.

6. The stylus of claim 5, wherein the collector comprises a lens.

25 7. The stylus of claim 1, wherein the light guide is an integral part of the housing.

8. The stylus of claim 7, wherein the light guide comprises a reflective inner surface of the housing.

9. The stylus of claim 1, wherein the light guide comprises a multilayer polymeric optical film.

5 10. The stylus of claim 9, wherein the multilayer polymeric optical film reflects at least 80% of light incident thereon.

11. The stylus of claim 10, wherein the multilayer polymeric optical film reflects at least 95% of light incident thereon.

10 12. The stylus of claim 11, wherein the multilayer polymeric optical film reflects at least 99% of light incident thereon.

15 13. The stylus of claim 1, wherein the stylus comprises an optical element proximate the tip of the stylus in optical communication with the light guide, wherein the optical element focuses the emitted light to a point.

14. The stylus of claim 1, wherein the tip of the stylus comprises a conformable member that is configured to contact the input surface of the user input device.

20 15. The stylus of claim 14, wherein the conformable member is an integral part of the housing.

25 16. The stylus of claim 14, wherein a portion of the conformable member is located within the housing and another portion extends beyond the housing to form the exit aperture.

17. The stylus of claim 14, wherein the conformable member comprises a sleeve that fits over the housing proximate the tip and extends beyond the housing to form the exit aperture.

18. The stylus of claim 14, wherein the conformable member comprises a polymeric material.

19. The stylus of claim 14, wherein the conformable member comprises rubber.

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20. The stylus of claim 1, wherein the stylus further comprises a resilient member coupled to a cylinder positioned within the housing proximate the tip, wherein the cylinder forms the exit aperture, wherein the cylinder is slidably coupled to the tip such that the cylinder changes the cross-sectional area of the emitted light when at least a portion of the tip is in contact with the input surface of the user input device.

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21. The stylus of claim 1, wherein the defined intensity profile comprises a dark region at least partially surrounding a light region, wherein the contrast between the dark region and the light region is detectable by the user input device.

22. A user input device, comprising:

a plurality of light sensors disposed to detect light transmitted through an input surface of the user input device;

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a stylus configured to collect ambient light and emit the collected light through a tip of the stylus, wherein the stylus produces a defined intensity profile detectable by the user input device when at least a portion of the tip of the stylus is proximate the input surface of the user input device; and

electronics coupled to the plurality of light sensors and configured to determine the location of the defined intensity profile produced by the stylus at a reference plane.

23. The device of claim 22, wherein the stylus further comprises:

a housing comprising an entrance aperture configured to collect ambient light and an exit aperture configured to emit the collected light, wherein the exit aperture is proximate the tip of the stylus; and

a light guide disposed within the housing, wherein the light guide is in optical communication with the entrance aperture and the exit aperture such that the light guide directs the collected light from the entrance aperture to the exit aperture.

5 24. The device of claim 22, wherein the input surface comprises an exterior surface of an electronic display.

25. The device of claim 24, wherein the electronic display comprises a liquid crystal display.

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26. The device of claim 24, wherein the electronic display comprises an organic electroluminescent display.

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27. The device of claim 24, wherein the plurality of light sensors are integrated into a transistor array that controls pixels of the electronic display.

28. The device of claim 22, wherein the reference plane is the input surface.

29. An electronic display system, comprising:

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a user input device, wherein the user input device comprises:

a plurality of light sensors disposed to detect light transmitted through an input surface of the user input device;

a stylus configured to collect ambient light and emit the collected light through a tip of the stylus, wherein the stylus produces a defined intensity profile detectable by the plurality of light sensors of the user input device when at least a portion of the tip of the stylus is proximate the input surface of the user input device; and

25 electronics coupled to the plurality of light sensors and configured to determine the location of the defined intensity profile produced by the stylus at a reference plane; and

an electronic display disposed to display information through the input surface of the user input device.

30. The system of claim 29, wherein the electronic display is a liquid crystal display.

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31. The system of claim 30, wherein the plurality of light sensors is incorporated into the liquid crystal display.

10 32. The system of claim 29, wherein the electronic display comprises a plurality of organic electroluminescent light-emitting devices.

33. The system of claim 32, wherein at least a portion of the plurality of organic electroluminescent light-emitting devices are used as the plurality of light sensors.

15 34. A method for using an input device, comprising:

providing a stylus configured to collect ambient light and emit the collected light through a tip, wherein the stylus produces a defined intensity profile;

providing an input device comprising a plurality of light sensors disposed to detect the defined intensity profile produced by the stylus when the defined intensity profile is transmitted through an input surface of the input device;

positioning the stylus proximate the input surface of the input device;

detecting the defined intensity profile only when at least a portion of the tip of the stylus is proximate the input surface of the input device; and

determining the location of the defined intensity profile at a reference plane.

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